PRODUCTIVITY OF PEARY CARIBOU AND MUSKOXEN ON BANKS AND MELVILLE ISLANDS, NT, JULY 2004

Northwest Territories Environment and Natural Resources

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2009

Manuscript Report No. 204

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ABSTRACT

Caribou productivity (number of calves per 100 ≥ 2 years and older females) was estimated on Banks and Melville islands during 2 to 9 July 2004. Transects were flown to obtain island-wide coverage on Banks Island while only the southern portion of the Dundas Peninsula on Melville Island was flown. There were 29 calves per 100 cows on Banks Island. This was the second lowest calf:cow ratio documented since an icing event that occurred in 1994. Only 5 caribou carcasses were found indicating that there had not been a die-off of caribou as a result of the icing event that occurred during October 2003. There were 37 calves per 100 cows on Melville Island. This was lower than that reported in 1999 and 2000, but was within the acceptable range. We found no evidence of a die-off of caribou on Melville Island, however we only covered a small portion of the island.

We observed a total of 4,689 muskoxen including 4,426 adults, 82 yearlings, and 181 calves. Calves and yearlings represented approximately 4% and 2% of all muskoxen observed, respectively. The proportion of calves in the muskoxen population observed during July 2004 was the lowest documented on Banks Island since 1992. The low proportion of yearlings indicates that recruitment to the population in 2004 was very low. The low proportion of calves indicates that recruitment to the population in 2005 will also be low. A total of 471 muskox carcasses were found, with approximately 84% of these located on the northern portion of the island. This suggests that the most severe icing conditions

occurred in this area. We believe that the underlying cause of the mortalities observed was malnutrition resulting from the severe icing condition on the island.

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INTRODUCTION

Sex and age classification surveys of Peary caribou were conducted sporadically on Banks Island prior to 1990. Between 1994 and 1998, surveys were conducted annually during summers (Larter and Nagy, 2000a). Surveys were conducted during summers on Melville Island from 1998 to 2000, respectively (Larter and Nagy, unpubl. data). These surveys have been used to estimate productivity, over winter survival, and recruitment of caribou, and in recent years the data have indicated increased recruitment on both Banks and Melville islands (Larter and Nagy, 2000a). An island-wide population survey of Banks Island showed a recent increase in number to about 1,200 non-calf caribou, up from the early and late 1990s when there was a period of relative stability at about 800 non-calves (Nagy *et al.*, 1996; Larter and Nagy, 2000a). Population surveys of Melville and Victoria Island have been much less frequent. It was believed that there were few Peary caribou on Melville Island after a survey in 1997 showed low numbers (about 800) and many carcasses of both Peary caribou and muskox (F. Miller and A. Gunn, pers. comm.). Brief reconnaissance flights over the Dundas Peninsula in the summers from 1998 to 2000 counted 46 to 73 animals; calves were abundant.

Poor weather conditions on the arctic islands and on the mainland have hampered our ability to complete all required surveys during the past few years. Based on the island wide population survey completed in 2001, caribou numbers on Banks Island appear to have increased. However, reports of icing conditions on Banks Island during the fall of 2003 indicated that this population may once

again be in jeopardy. A fresh snowfall followed by rain and then low temperatures caused severe icing conditions on the western and northwestern portions of the island. John Lucas Sr. reported seeing large numbers of muskox carcasses on the western portion of the island and saw small numbers of muskoxen out on the sea ice west of Banks Island. Andy Carpenter Sr. reported groups of 30 to 40 muskoxen heading out onto the sea ice on southern Banks Island during March and April 2004. The overall impact of these icing conditions on productivity and recruitment of Peary Caribou and muskoxen on island was assessed.

METHODS

Caribou productivity was estimated by determining the number of calves present per 100 ≥ 2 years and older females. Banks Island was surveyed with a Bell 206L helicopter on 2, 3, 5, 6, 7, 8, and 9 July 2004 while Melville Island was surveyed on 4 and 5 July 2004. Transects on Banks Island were flown to obtain island-wide coverage (Figure 1). Only the southern portion of the Dundas Peninsula was surveyed because of limited helicopter hours (Figure 2). Flight altitude varied from 300 to 500 feet above ground level. Caribou and muskoxen were counted and classified within a 1.5-km wide strip on either side of the aircraft. Caribou were classified as cows, calves, yearlings, young bulls and mature bulls. Muskoxen were classified as adults, yearlings, and calves. All caribou mortality sites were documented and investigated to determine the cause of mortality. All muskox carcasses that had not been extensively scavenged were documented. The coordinates of all sightings were recorded using a Garmin

12XL GPS. The numbers of caribou and muskox observed on Banks Island during the survey were summarized by the blocks surveyed in early July 2001 (Figure 1).

Digital photographs were taken of most of the caribou groups observed on Melville Island. A review of these photos indicated that a number of the caribou observed were in poor condition, with ribs, spine, and/or pelvis visible. We classified the condition of these animals as good (ribs, spine, and pelvis not visible) and poor (ribs, spine, and/or pelvis visible). This review also indicated that some of the animals that we originally classified as young bulls were females. We re-classified the groups that we had photographed and applied a correction factor to groups that were not photographed.

RESULTS AND DISCUSSION

Banks Island Peary Caribou

The number of Peary caribou and carcasses observed on transect is given in Table 1. The distribution of caribou observed on transect is shown in Figure 3. The distribution of caribou observed during the 2001 whole-island survey is shown for comparative purposes in Figure 4. The majority of caribou observed during the July 2004 survey were on the northwestern portion of the island (2001 survey blocks A, B, and C) (Figure 3 and Table 1). This is consistent with the distribution of caribou observed during the 2001 whole-island survey (Figure 4).

We observed a total of 112 Peary caribou including 62 adult females, 7 adult males, 20 young males, 5 yearlings, and 18 calves. The cow:calf ratio was 29 calves per 100 cows. Figure 5 provides a comparison of calf:cow ratios documented during the period 1994 to 2004. The calf:cow ratio observed during July 2004 was the second lowest documented on Banks Island since 1994. Freezing rains occurred on the island during October 1993. The lowest calf:cow ratio documented occurred the following summer (July 1994). Productivity and recruitment should be monitored over the next few years to determine the short term affects of the severe 2003–2004 winter conditions on the caribou population growth.

Only 5 caribou carcasses were found. The causes of death for the majority of these were difficult to determine although predation was suspected in at least 2 cases. The absence of caribou carcasses or patches of caribou hair indicates that there had not been a die off of caribou on the island resulting from the icing conditions that occurred during October 2003.

Caribou on the northwestern portion of the island (2001 survey block A) appeared to be in poor condition. The spine, ribs, and pelvis were visible on a majority of cows observed in this area (Figures 6 and 7). Calves accompanying these cows were small (calf height lower than the cows' belly line) suggesting that they were born during late June or early July. The calves of cows that are in poor condition may not survive. Cows on the southern portion of the island appeared to be in better condition and had older calves that were likely born in mid June (calf height greater than the cows belly line).

Banks Island Muskoxen

The number of muskoxen and carcasses observed on transect is given in Table 2. The distribution of muskoxen observed on transect is shown in Figure 8. The distribution of muskoxen observed during the 2001 whole island survey is shown for comparative purposes in Figure 9. The majority of muskoxen observed during the July 2004 survey were survey blocks D, E, and H (Figure 8 and Table 2). This is consistent with the distribution of muskoxen observed during the 2001 whole-island survey. The majority of calves and yearlings were observed on the southern and central portions of the island (2001 survey blocks C, D, E, F, and G and southern portion of block H) (Figures 10 and 11).

We observed a total of 4,689 muskoxen including 4,426 adults, 82 yearlings, and 181 calves. Calves and yearlings represented approximately 4% and 2% of all muskoxen observed, respectively. Figure 12 provides a comparison of the proportion of calves observed in the populations during the period 1992 to 2004. The proportion of calves in the muskoxen population observed during July 2004 was the lowest documented on Banks Island since 1992. The low proportion of yearlings indicates that recruitment to the population in 2004 was very low. The low proportion of calves indicates that recruitment to the population in 2005 will also be low. Although we were unable to assess the condition of the live muskoxen, one would expect that the general condition of the population, particularly on the northwestern portion of the island, was poor. This suggests that breeding success may be reduced during late summer 2004, resulting in

poor calf production in 2005. Productivity and recruitment should be monitored over the next few years to determine the short term affects of the severe 2003–2004 winter conditions on muskox population growth. A survey should be conducted during the next few years to determine population size.

A total of 471 muskox carcasses were found (Figure 13 and Table 2). Approximately 84% of these were located on the northern portion of the island (2001 survey blocks A and B and the northern portion of block H) suggesting that the most severe icing conditions were in this area. We examined a number of carcasses. These animals were emaciated, formed fecal pellets were observed in the area around the carcasses, and we saw no evidence of diarrhea. Evidence from the ground around most carcasses indicated that the animals experienced spasms prior to death, and death was sudden. These two conditions are inconsistent with malnutrition. We believe that the underlying cause of the mortalities observed was malnutrition resulting from the severe icing condition on the island. Animals that are in poor condition are more susceptible to other pathogens. The prevalence of pathogens in the population should be documented during future commercial harvests.

Melville Island Caribou

The distribution of caribou observed on transect is shown in Figure 14. We observed a total of 121 caribou including 60 adult females, 12 adult males, 19 young males, 8 yearlings, and 22 calves. The cow:calf ratio was 37 calves per 100 cows. Figure 15 provides a comparison of calf:cow ratios documented during

the period 1999 to 2004. The calf:cow ratios observed during July 2004 was lower than that documented on Melville Island in 1999 and 2000, but was within the acceptable range for the time of year.

We found 2 caribou carcasses. The body position suggested that both animals died of malnutrition.

We classified the general condition of 79 caribou including 41 adult females, 12 adult males, and 26 yearlings from photos. Of these, approximately 15% of the adult females, 25% of the adult males, and 27% of the yearlings were considered to be in good condition. For the remaining caribou, the spine, ribs and/or pelvis were visible suggesting that they were in poor condition.

AKNOWLEDGEMENTS

This project was co-funded by the Department of Resources, Wildlife, and Economic Development (RWED) Species at Risk Fund, Yellowknife, NT; RWED Wildlife Studies Funding, Inuvialuit Final Agreement, Inuvik, NT; Polar Continental Shelf Project, Ottawa, OT; and Parks Canada Agency, Species at Risk Fund. Benedict, Canadian Helicopters Limited, Inuvik provided expert flying services. John Lucas Sr. and Trevor Lucas, Sachs Harbor Hunters and Trappers Committed assisted with surveys conducted on southern Banks Island. We thank Wendy Wright and Todd Slack, RWED, Inuvik for producing the figures.

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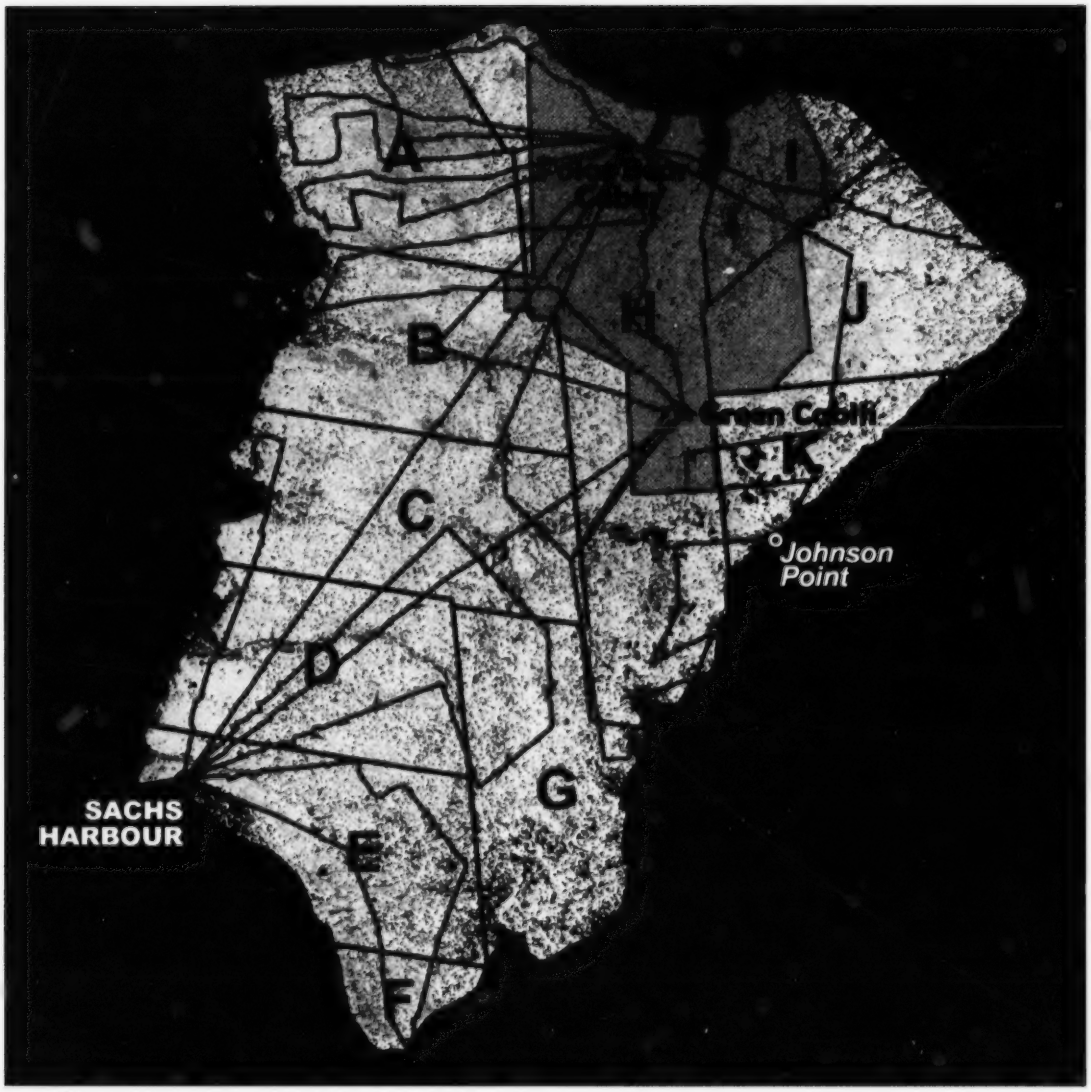


Figure 1. Transects flown on Banks Island, NT, July 2004 (boundaries of blocks surveyed in 2001 are shown).

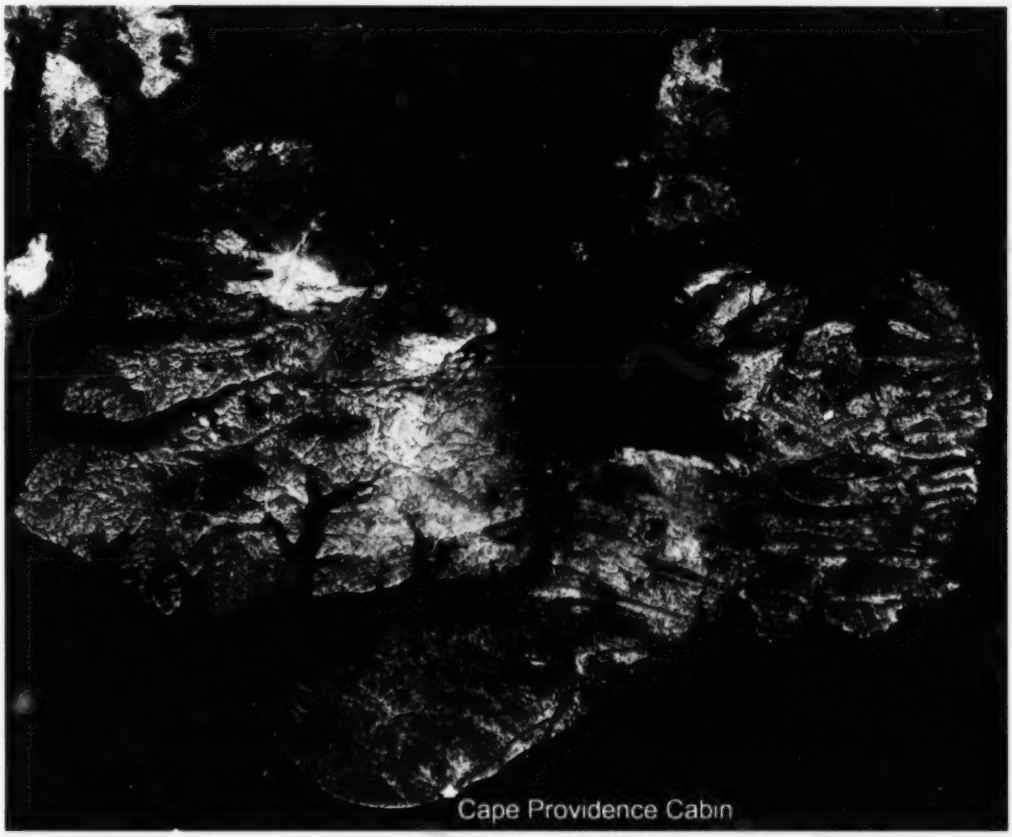
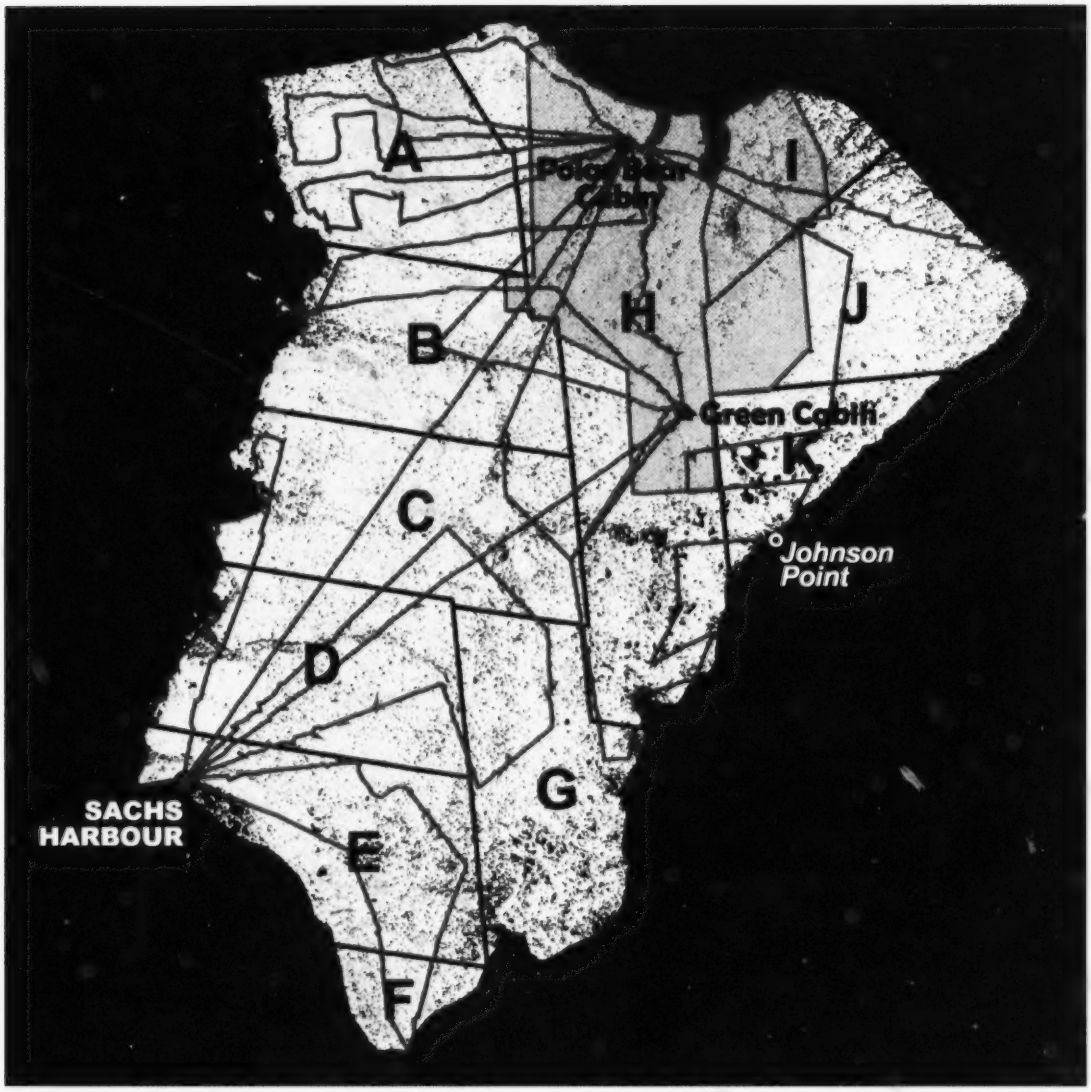


Figure 2. Transects flown on Melville Island, NT and NU, July 2004.



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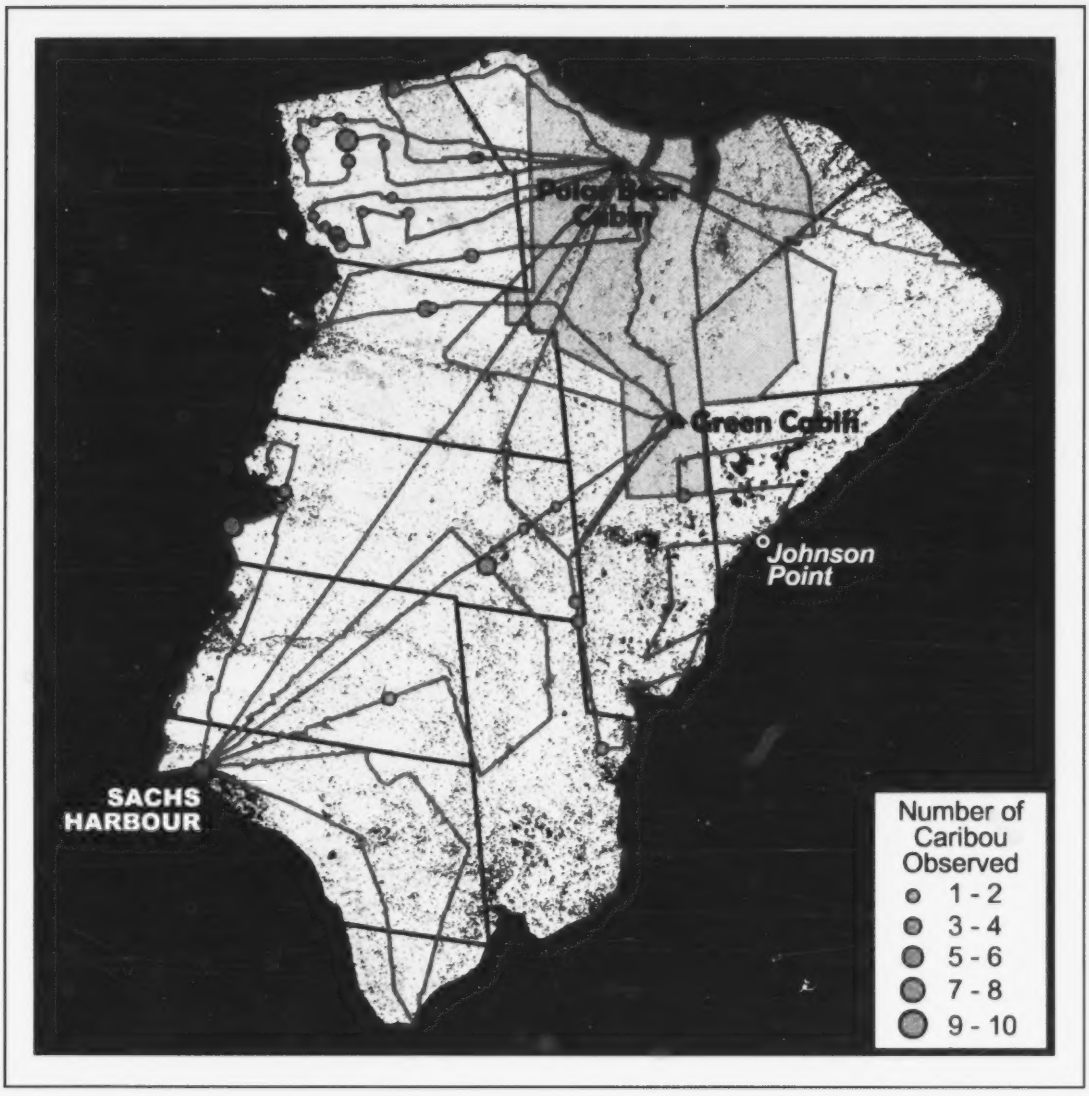


Figure 3. Distribution of caribou sightings on Banks Island, NT, July 2004.

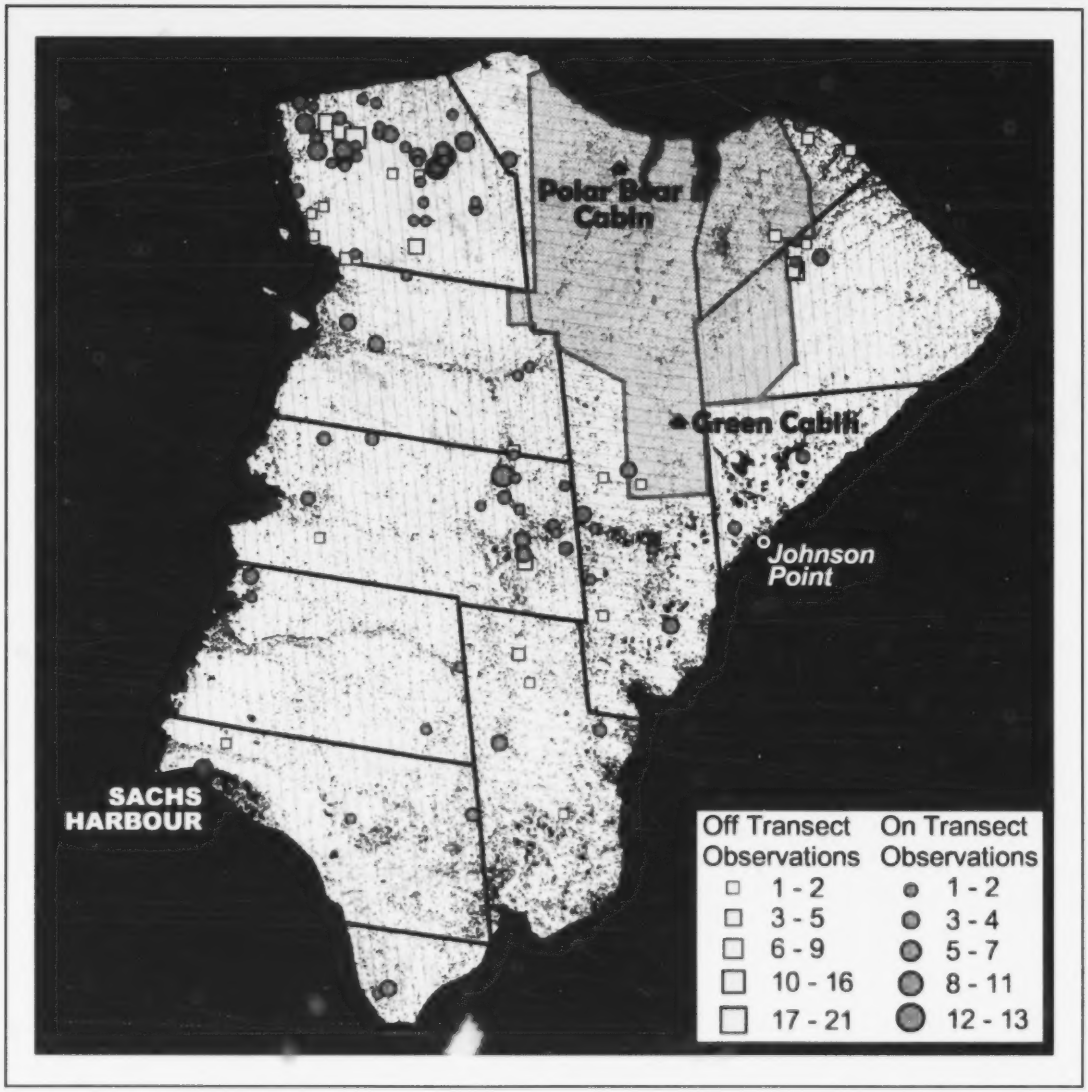
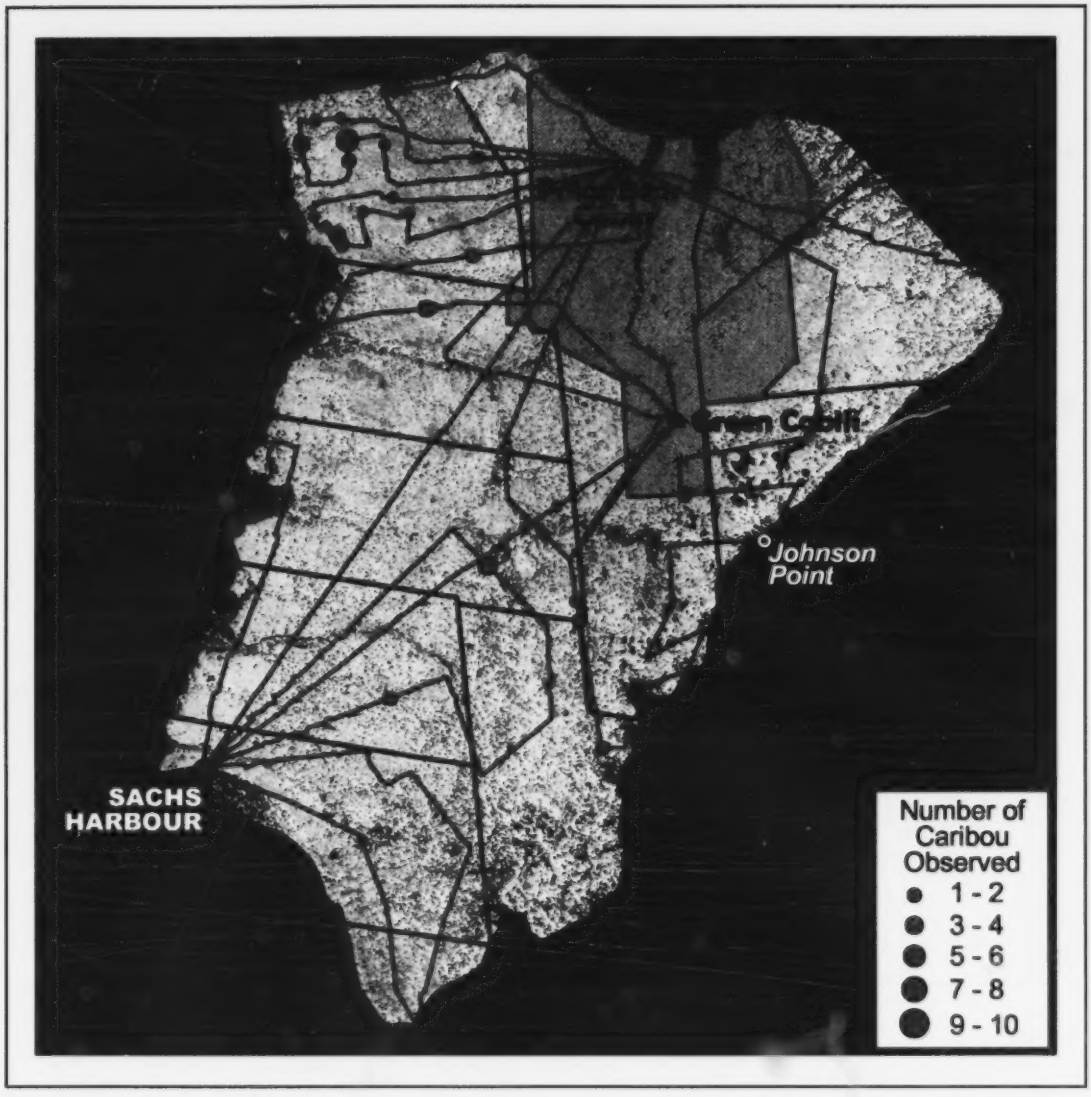


Figure 4. Distribution of caribou sightings, Banks Island, NT, July 2001.



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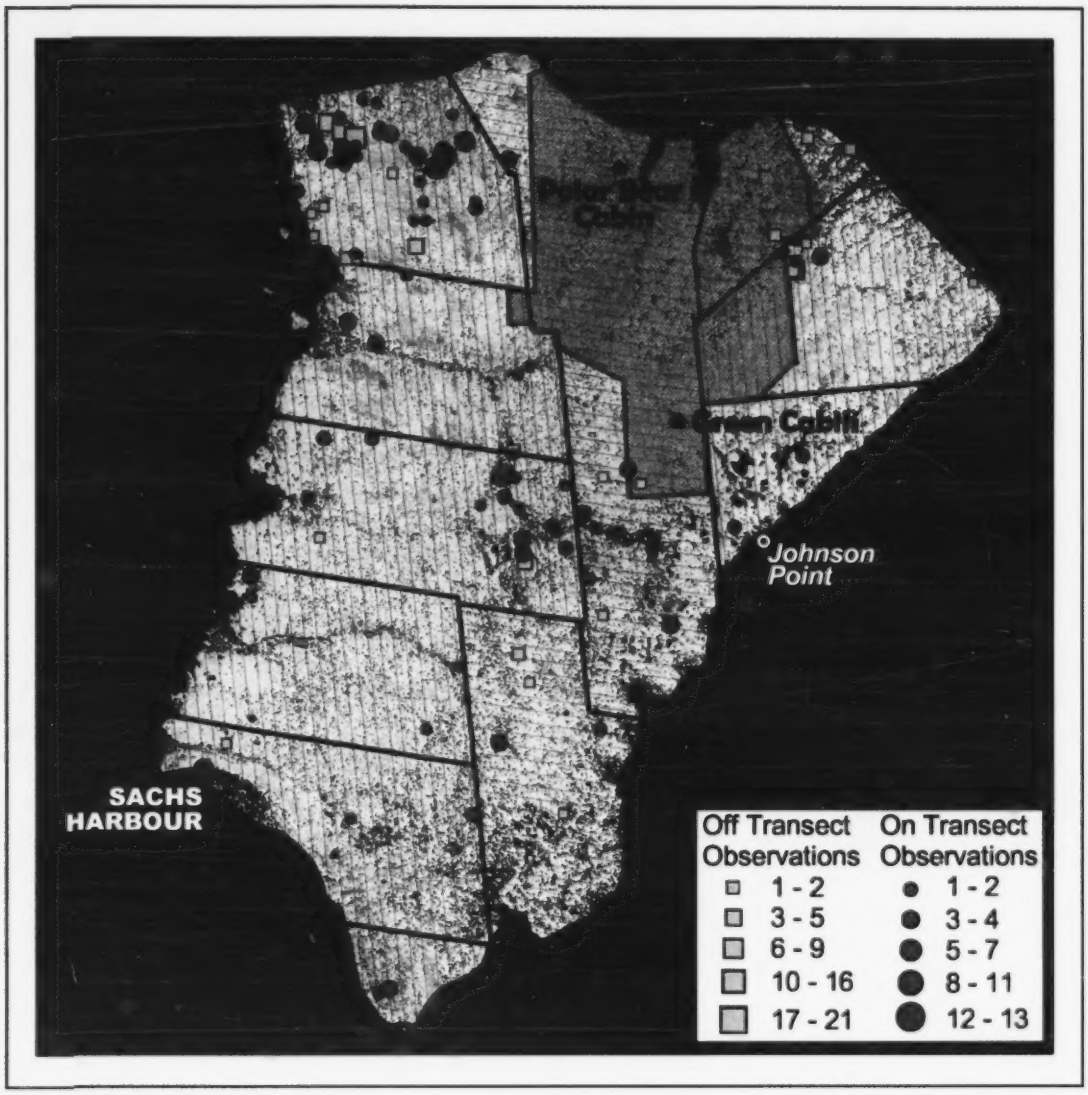


Figure 4. Distribution of caribou sightings, Banks Island, NT, July 2001.

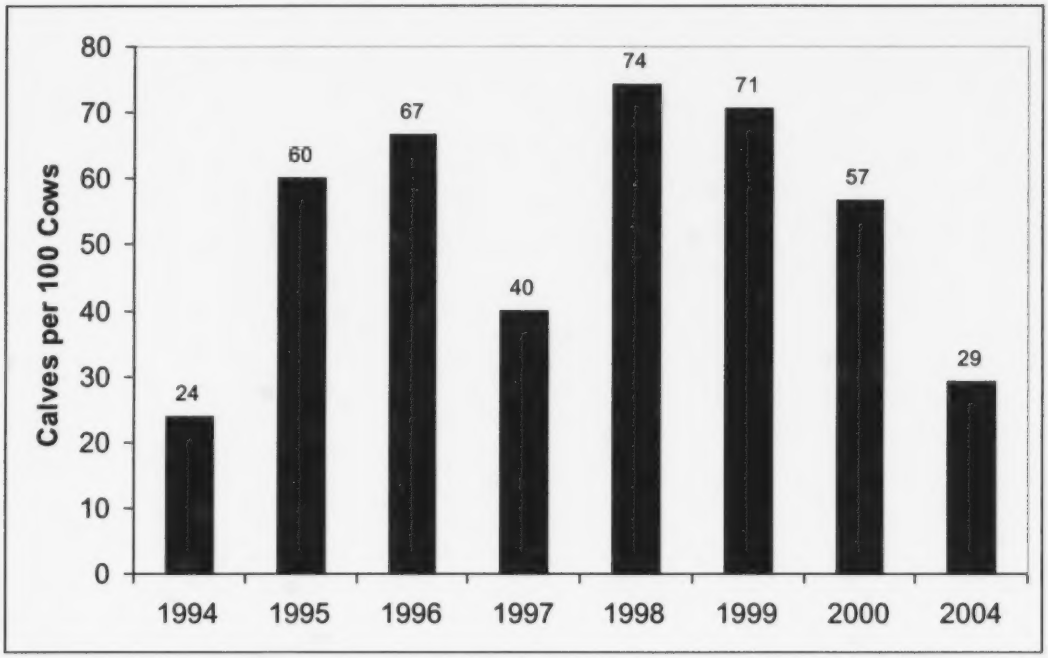


Figure 5. Calf production (number of calves per 100 adult females) for Peary caribou on Banks Island, NT, July 1994 to 2004[A].

[A] Data are from the following sources:
- 1994 (Larter and Nagy, 2000a; Larter N.C. and Nagy, 1999)
- 1995 (Larter and Nagy, 2000a; Larter N.C. and Nagy, 1999)
- 1996 (Larter and Nagy, 2000a; Larter N.C. and Nagy, 1999)
- 1997 (Larter and Nagy, 2000a; Larter N.C. and Nagy, 1999)
- 1998 (Larter and Nagy, 2000a; Larter N.C. and Nagy, 1999)
- 1999 (Larter and Nagy, 2000a; Larter N.C. and Nagy, 1999)
- 2000 (Larter and Nagy, unpublished data)
- 2004 (this report)

Figure 6. Adult female Peary caribou observed on northwestern Banks Island, NT, 3 July 2004. Spine and pelvis are prominently visible.

Figure 7. Adult female Peary caribou observed on northwestern Banks Island, NT, 3 July 2004. Spine, pelvis, and ribs are prominently visible. The distended udder indicates that this animal had calved but had recently lost its calf.

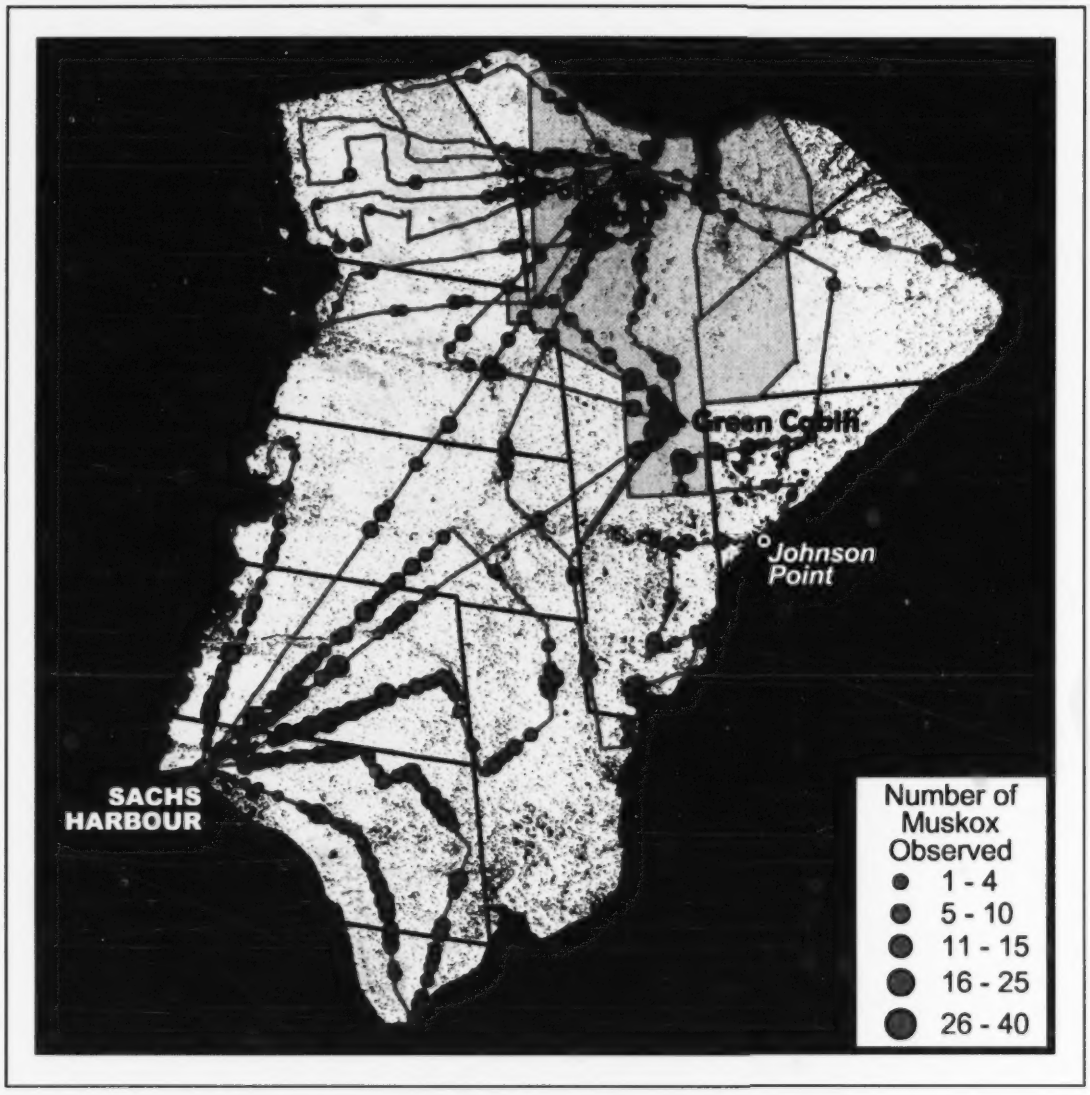


Figure 8. Distribution of sightings of muskoxen, Banks Island, NT, July 2004.

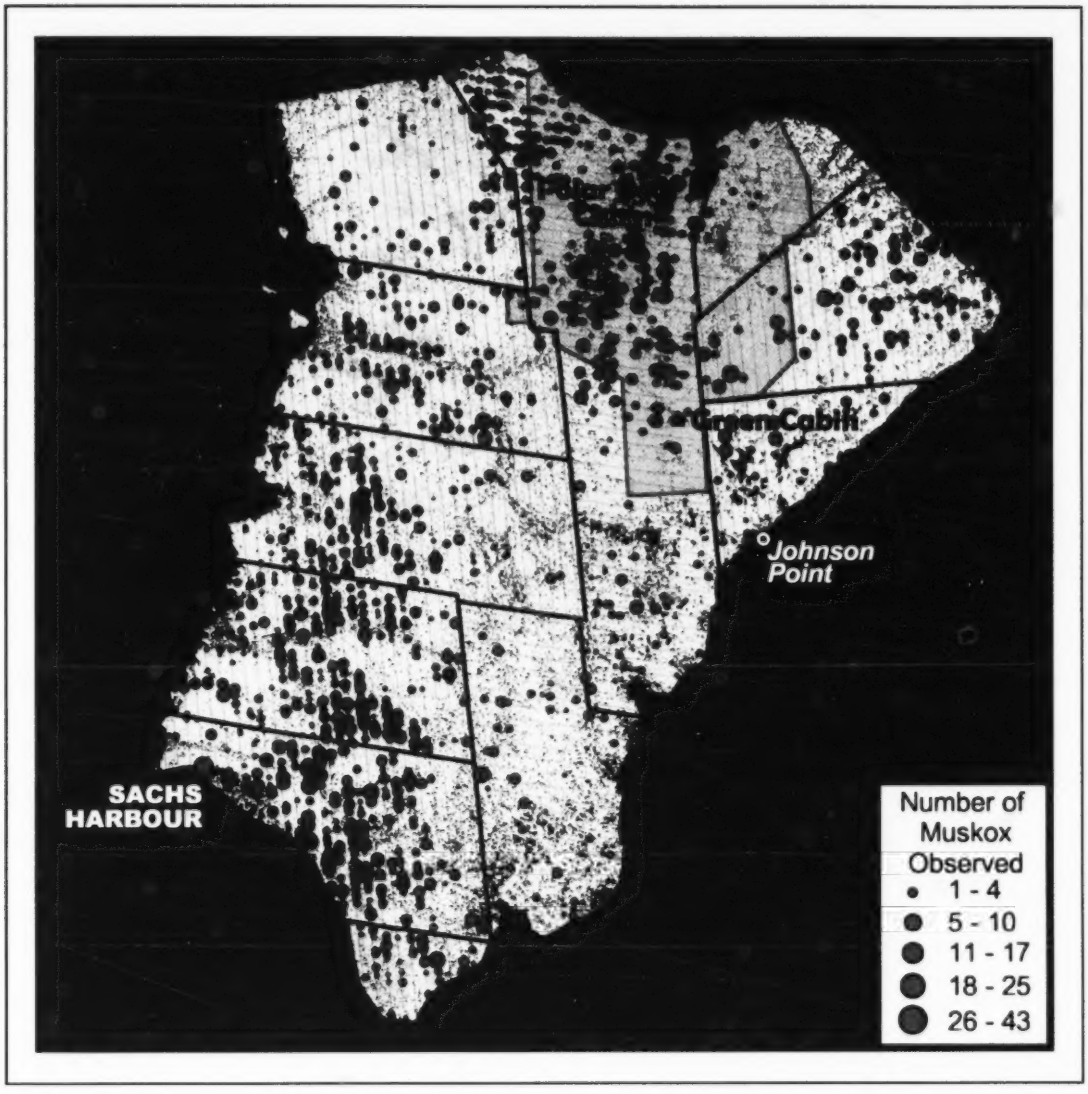
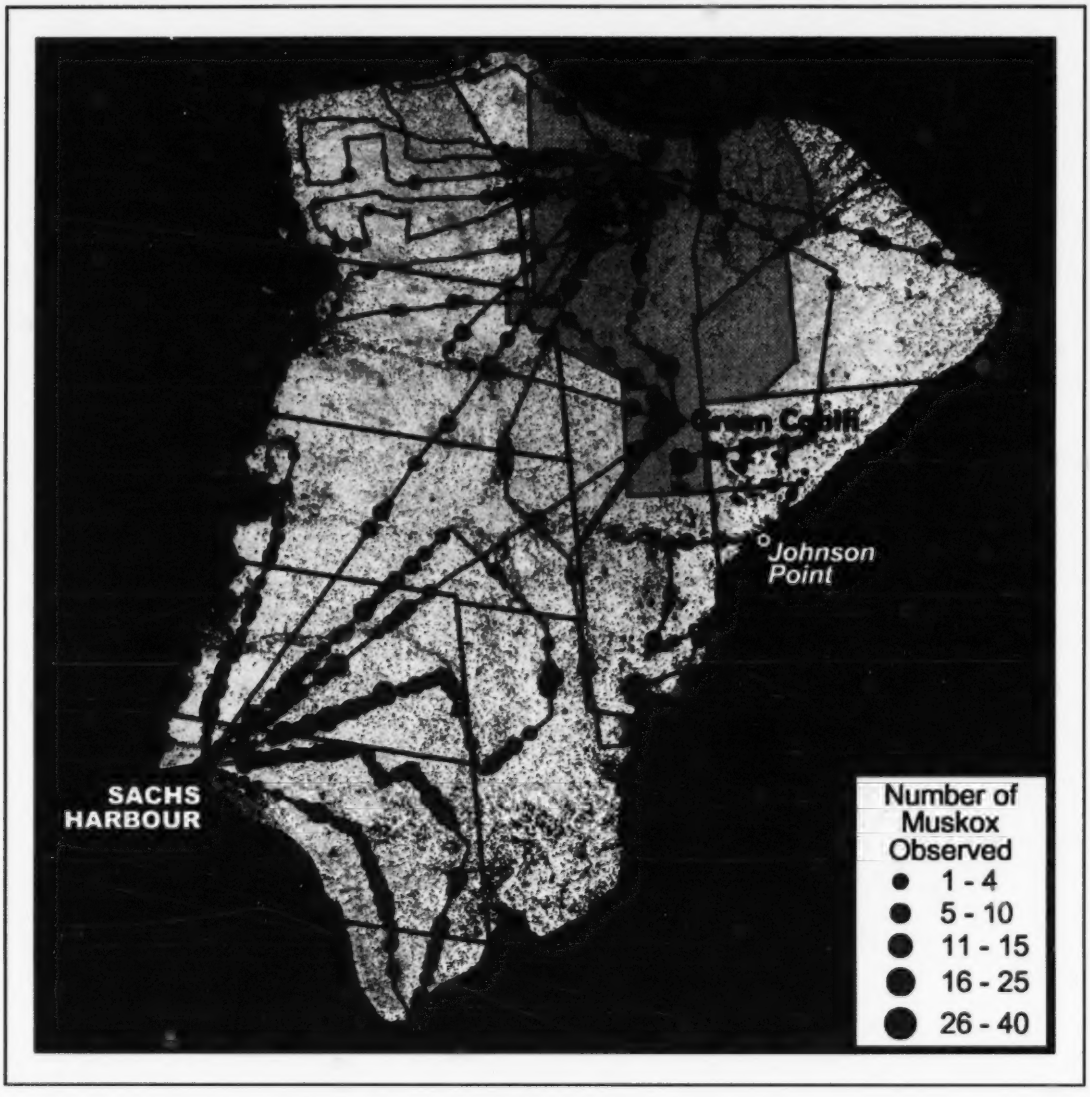


Figure 9. Distribution of sightings of muskoxen, Banks Island, NT, July 2001.



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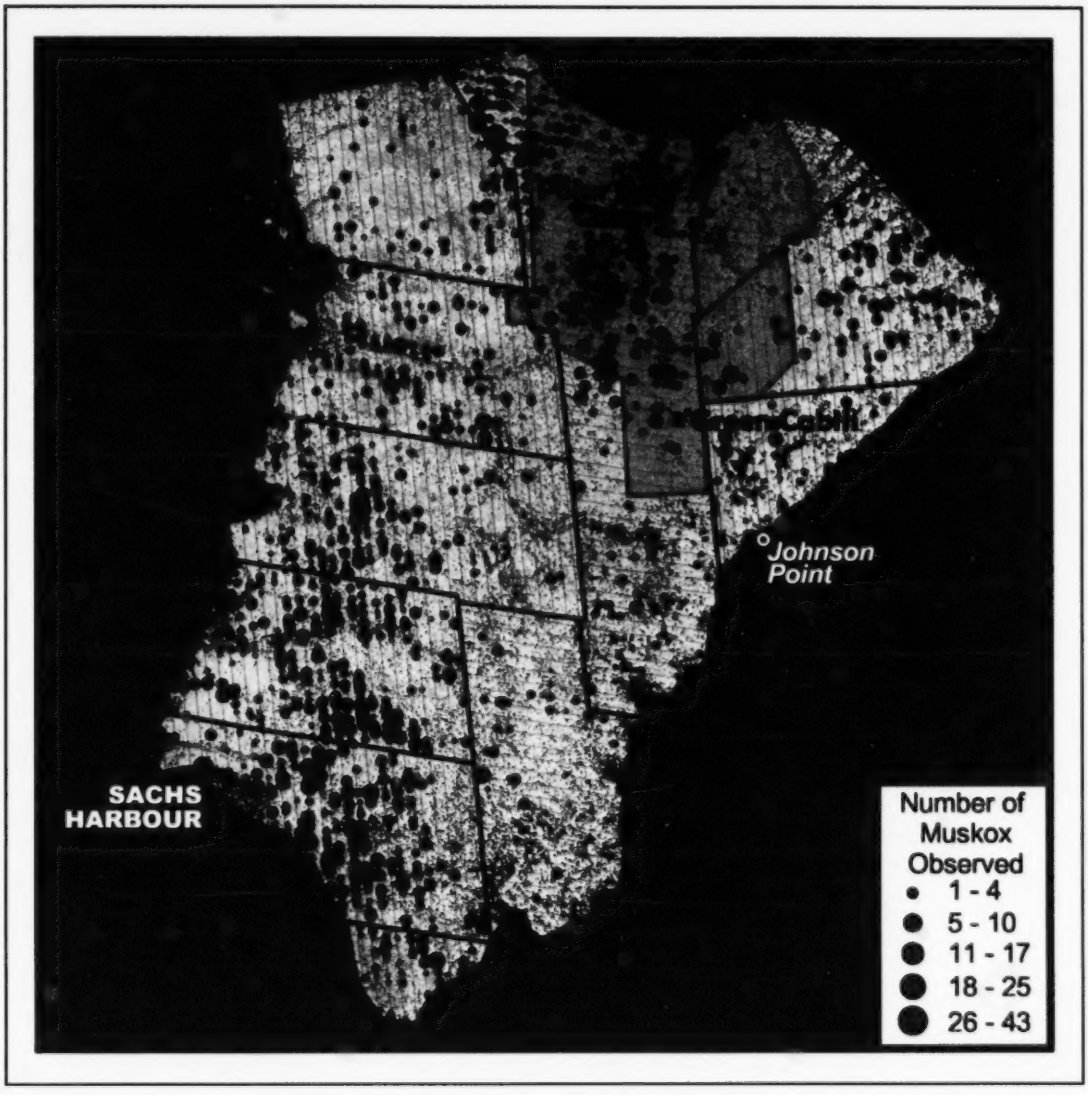

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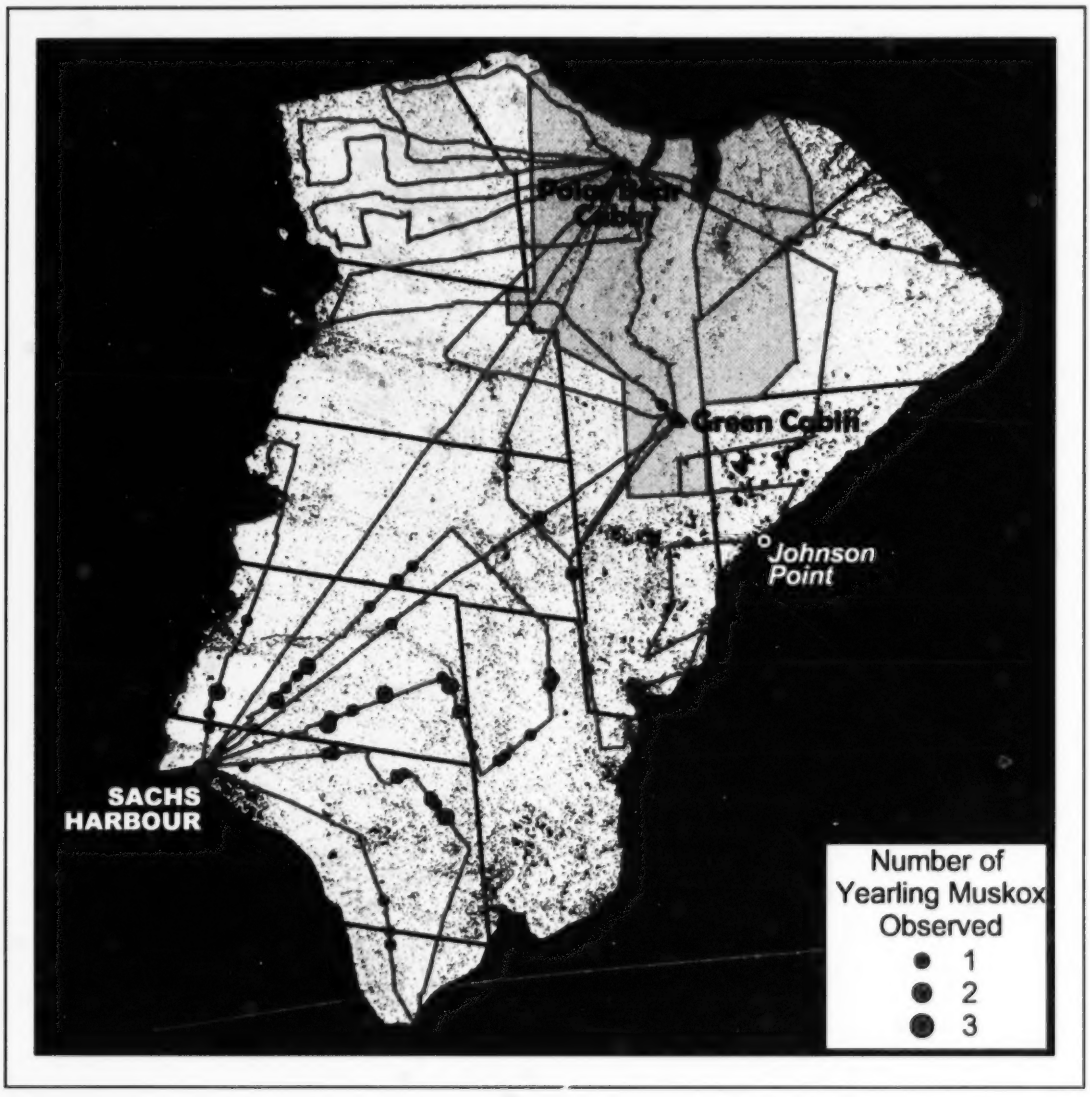


Figure 10. Distribution of sightings of yearling muskoxen, Banks Island, NT, July 2004.

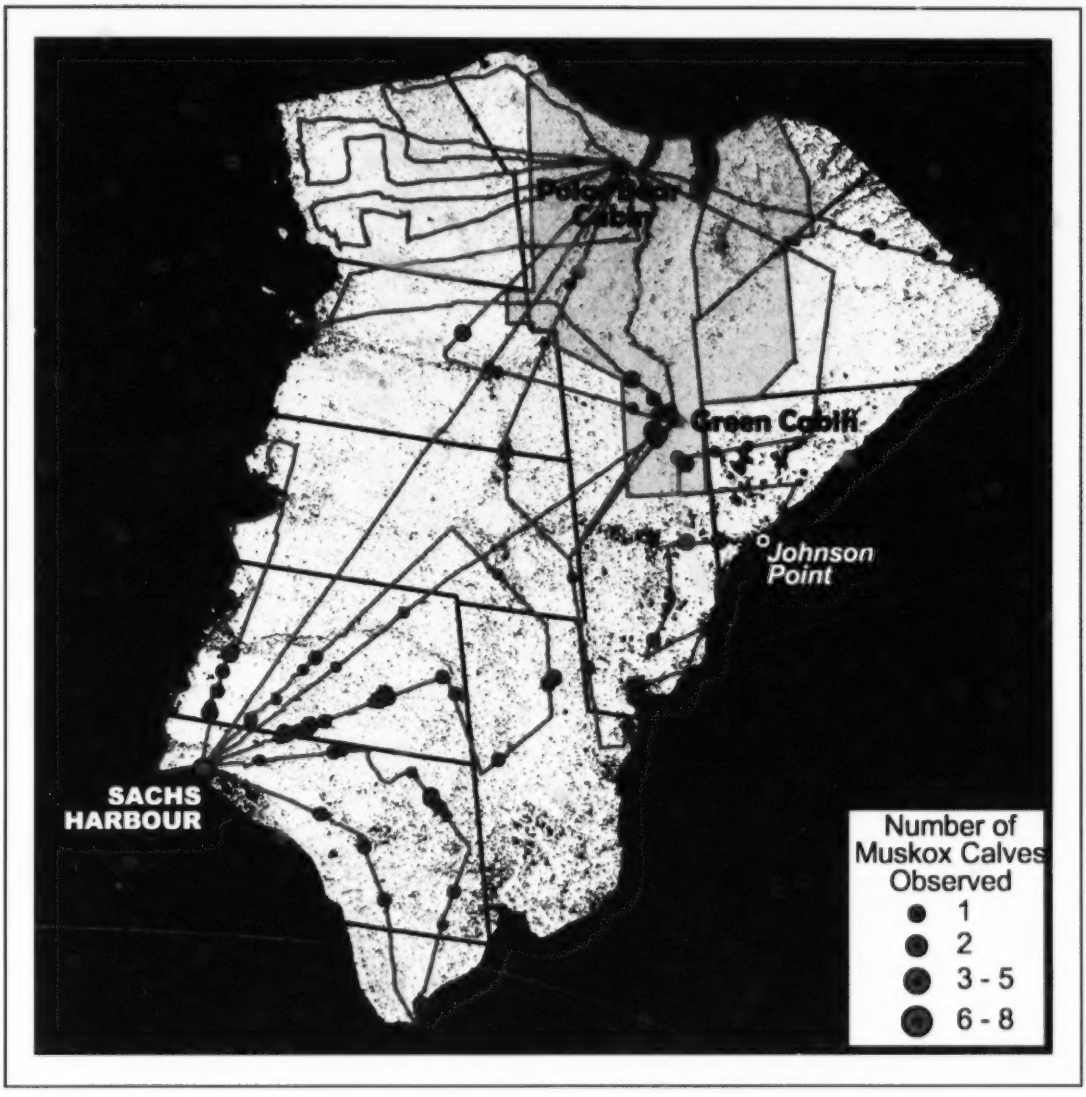


Figure 11. Distribution of sightings of muskoxen calves, Banks Island, NT, July 2004.

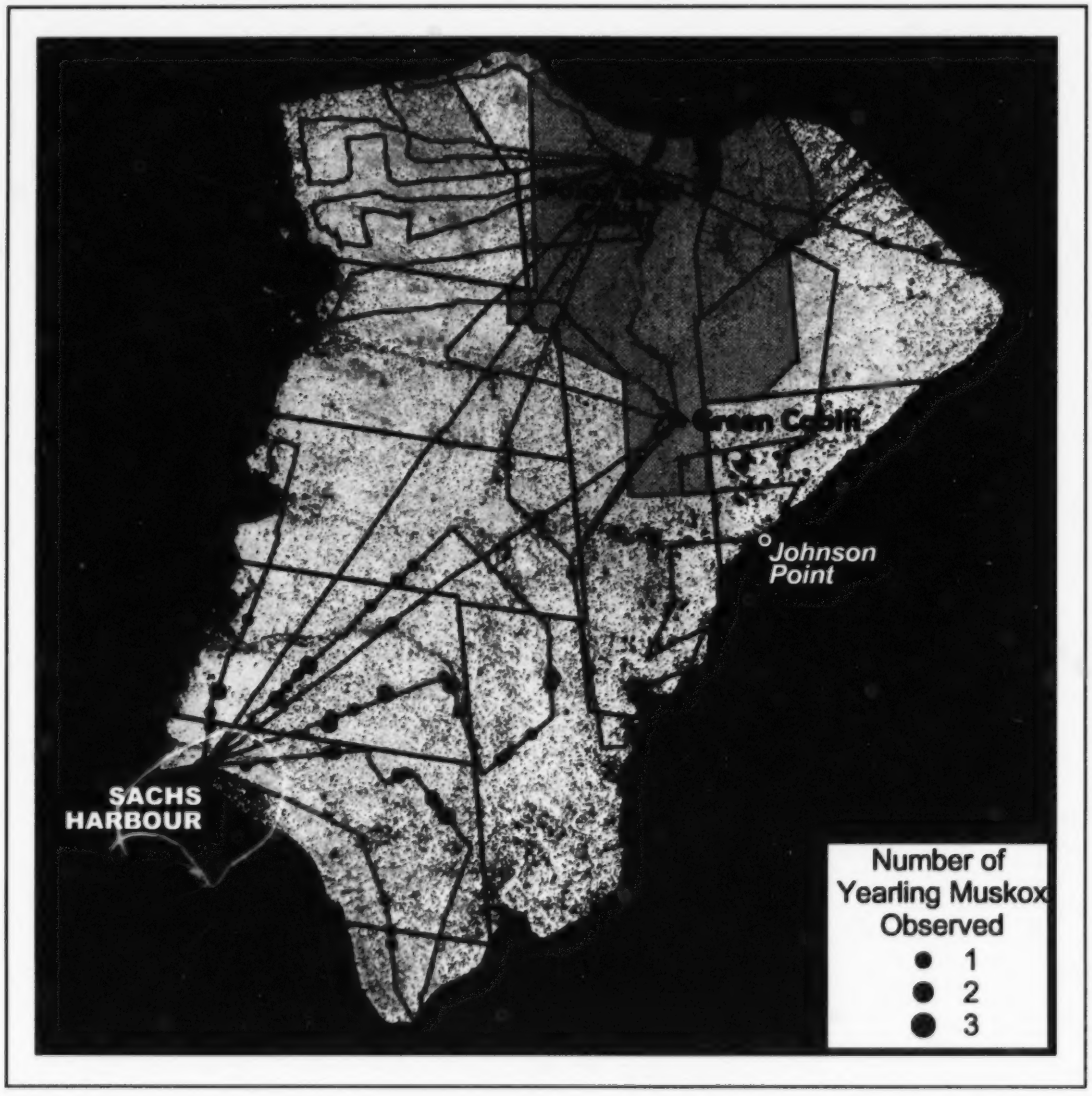
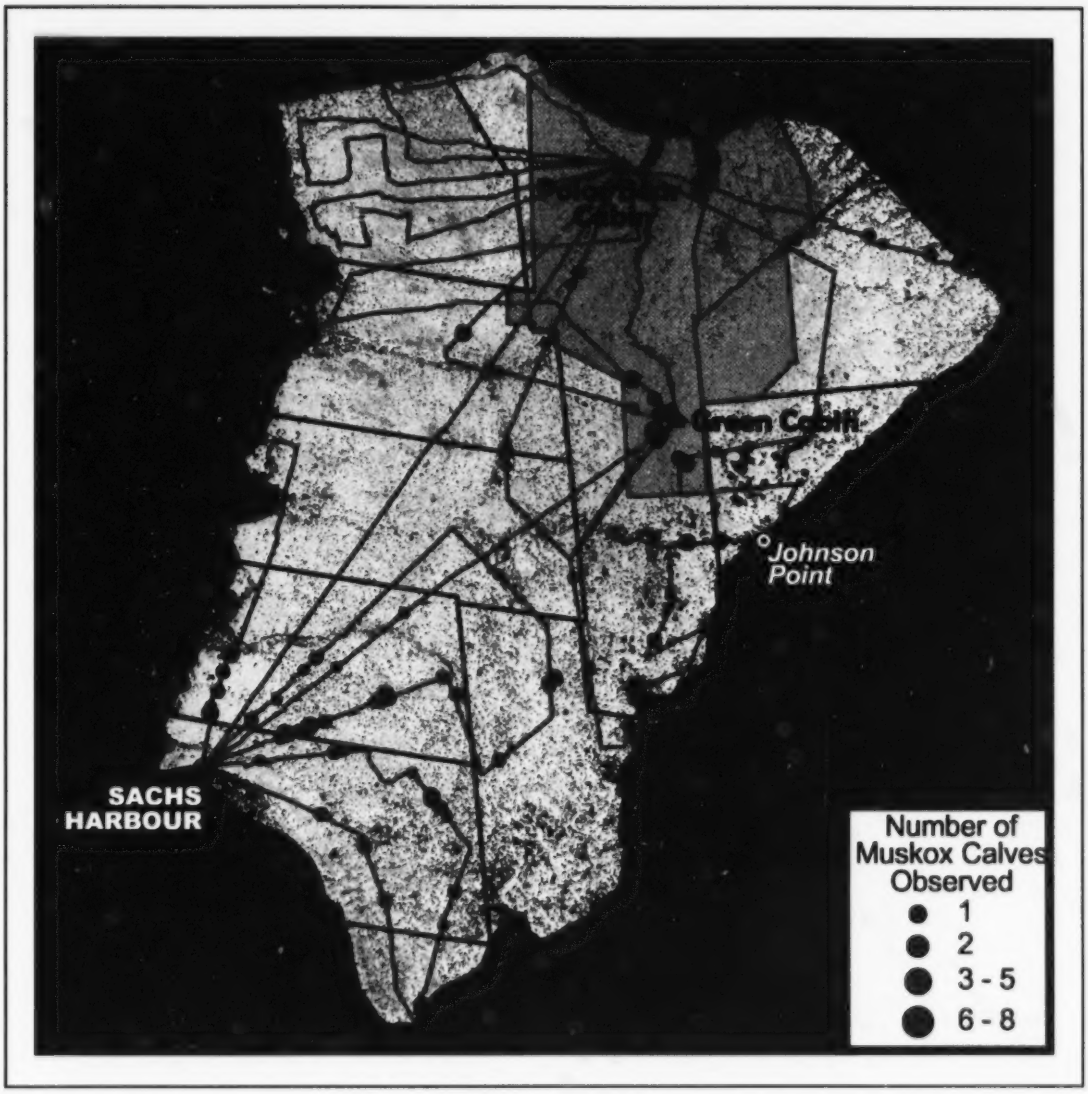


Figure 10. Distribution of sightings of yearling muskoxen, Banks Island, NT, July 2004.



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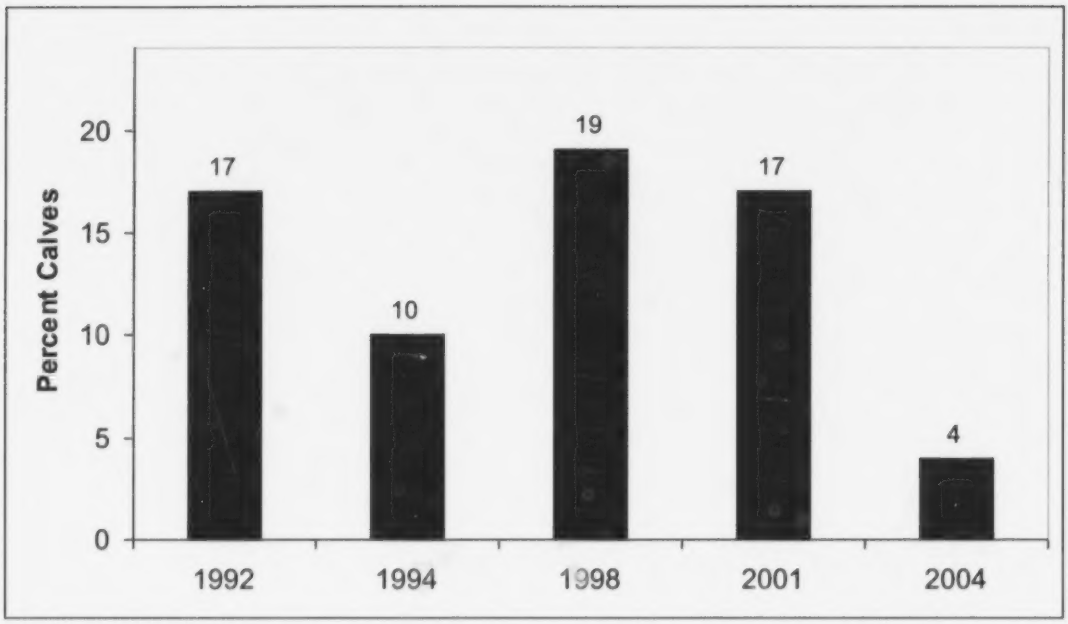


Figure 12. Number of calves as a proportion of the total number of muskoxen observed during the survey conducted on Banks Island, NT during early July 2004 and those observed during whole island surveys conducted in 1992, 1994, 1998, and 2001[A].

[A] Data are from the following sources:
- 1992 (Nagy *et al.*, 2007b; Larter N.C. and Nagy, 1999)
- 1994 (Nagy *et al.*, 2007c; Larter N.C. and Nagy, 1999)
- 1998 (Nagy *et al.*, 2007d; Larter N.C. and Nagy, 1999)
- 2001 (Nagy *et al.*, 2007e)
- 2004 (this report)

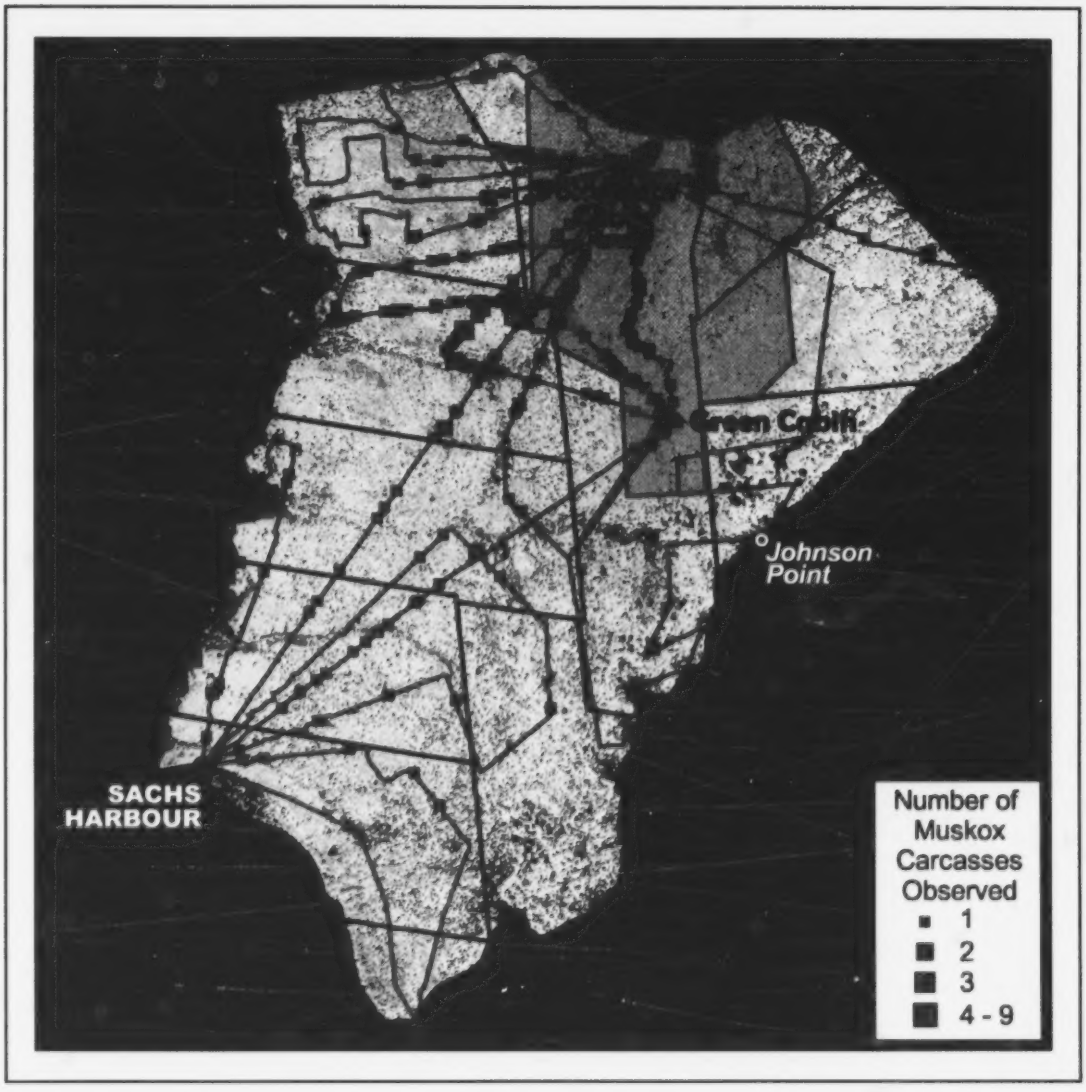
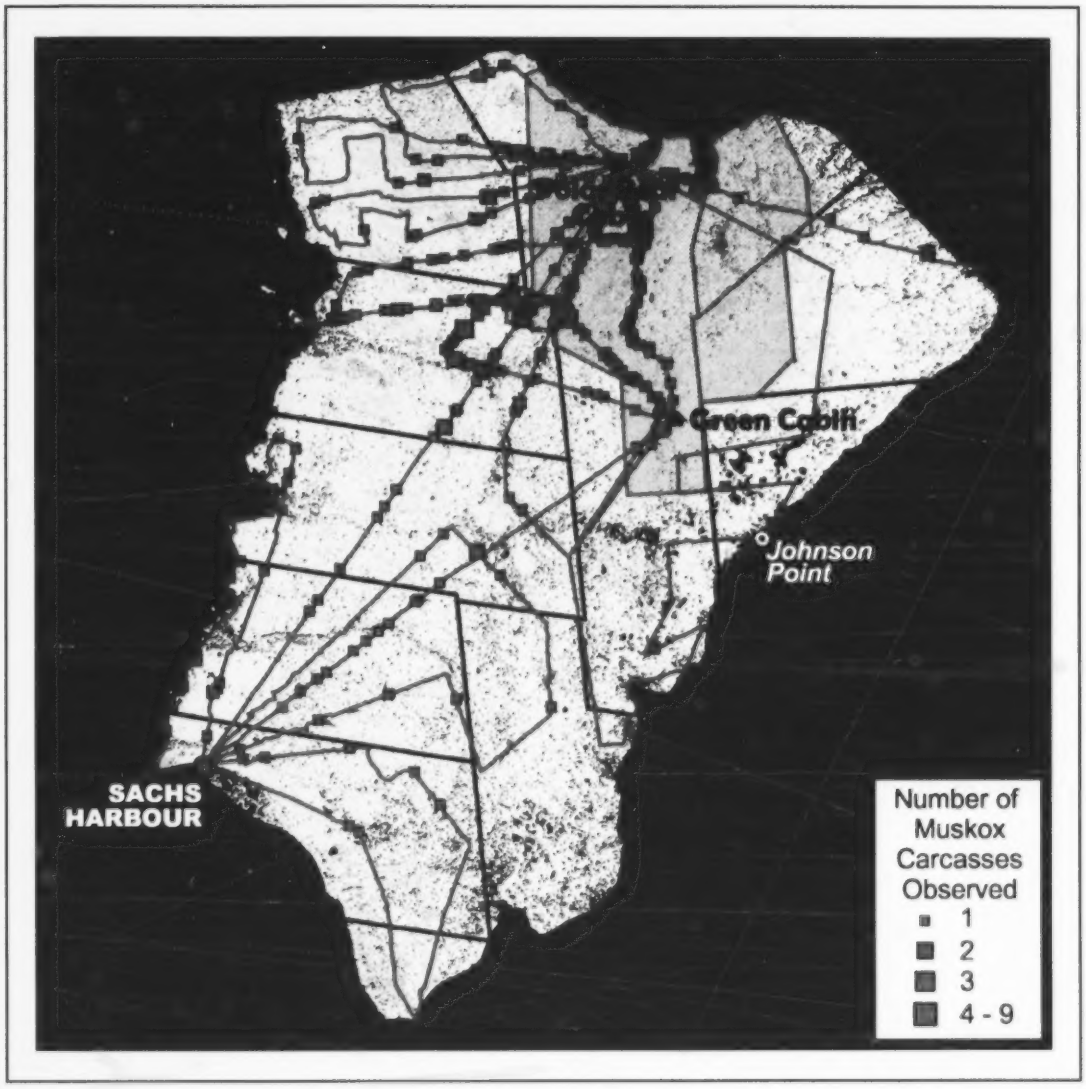


Figure 13. Distribution of dead muskoxen, July 2004.



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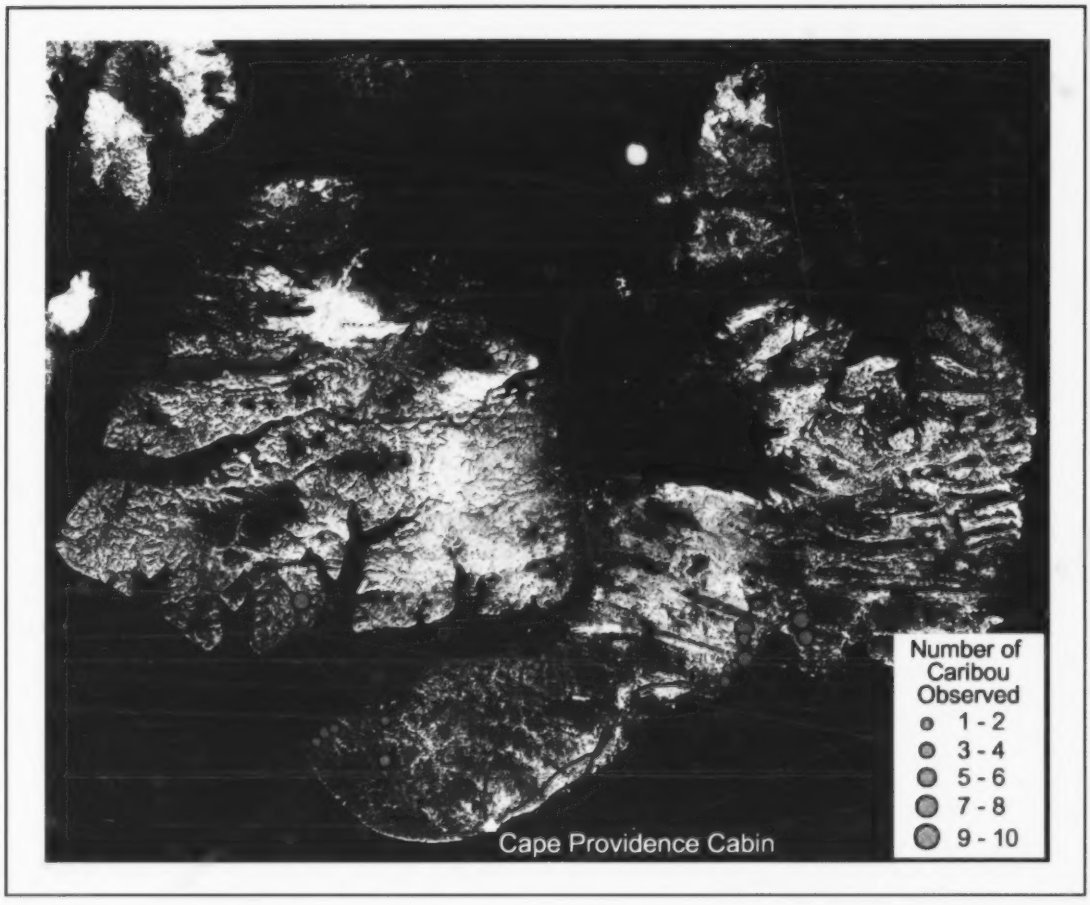

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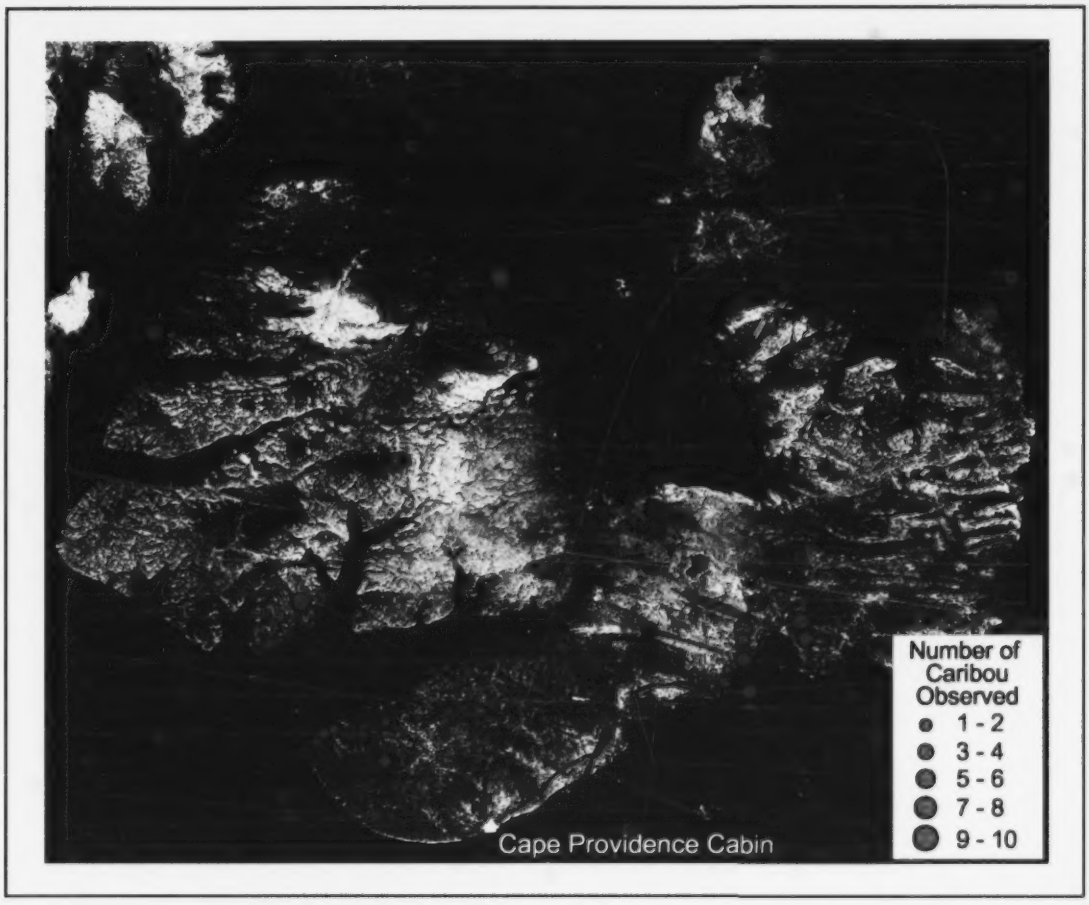

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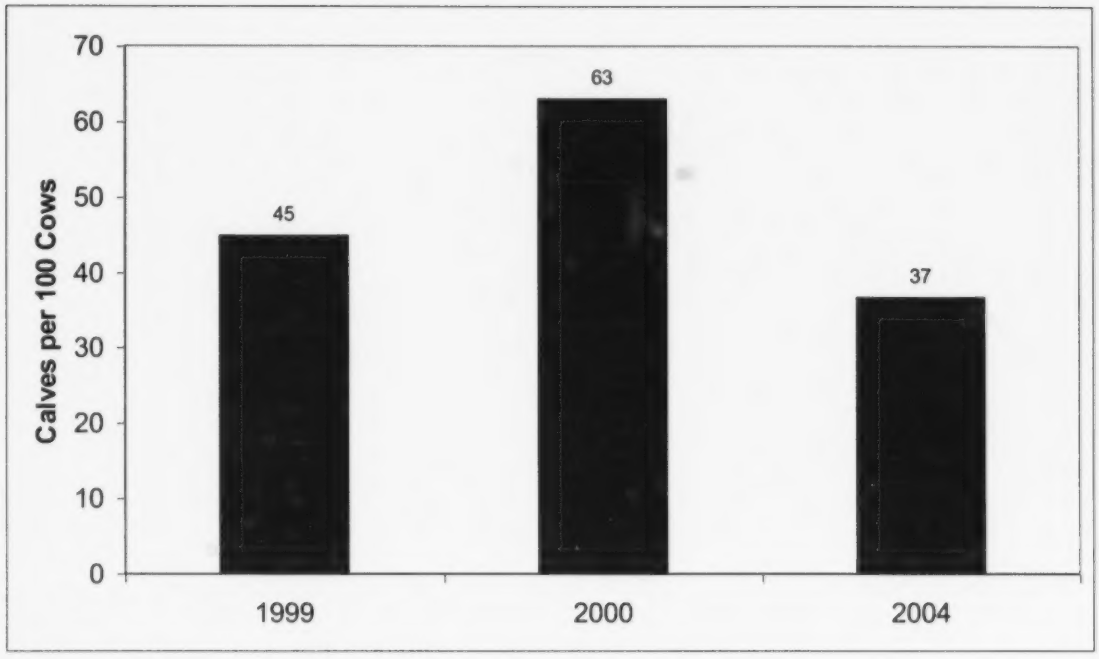

Figure 15. Calf production (number of calves per 100 adult females) for Peary caribou on Melville Island, July 1999 to 2004[A].

[A] Data are from the following sources:
- 1999 (Larter and Nagy, 2000b)
- 2000 (Larter and Nagy, unpublished data)
- 2004 (this report)

Table 1. Number of Peary caribou and carcasses observed on transect on Banks Island during July 2004 by blocks surveyed in 2001.

2001 Survey Blocks	Block Area (km^2)	Length of Transect Lines Flown (km)	Area Surveyed (km^2)	Percent Coverage	Number Observed on Transect						
					Cows	Calves	Yearlings	Young Bulls	Mature Bulls	Total Live	Carcass
A	6249	614	1775	0.28	25	6	6	23	1	61	4
B	6626	343	947	0.14	4	0	0	2	0	6	0
C	8009	443	1250	0.16	9	8	1	10	1	29	0
D	6926	508	1467	0.21	1	0	0	2	1	4	0
E	6603	448	1188	0.18	0	0	0	0	0	0	0
F	1406	81	219	0.16	0	0	0	0	0	0	0
G	6770	153	424	0.06	4	4	0	0	0	8	0
H	14765	1417	3513	0.24	0	0	1	0	3	4	1
I	3050	126	243	0.08	0	0	0	0	0	0	0
J	6970	226	432	0.06	0	0	0	0	0	0	0
K	3211	145	412	0.13	0	0	0	0	0	0	0
BNI[A]					0	0	0	0	0	0	0
total	70585	4505	11870	0.17	43	18	8	37	6	112	5
		Corrected Totals			62	18	5	20	7	112	

[A] Bernard Island

Table 2. Number of muskoxen and carcasses observed on transect on Banks Island during July 2004 by blocks surveyed in 2001.

Survey Block	Block Area (km2)	Length of Transect Lines Flown (km)	Area Surveyed (km2)	Percent Coverage	Number Observed on Transect				
					Adults	Yearlings	Calves	Total	Carcass
A	6249	614	1775	0.28	80	0	0	80	35
B	6626	343	947	0.14	161	0	7	168	93
C	8009	443	1250	0.16	220	8	5	233	20
D	6926	508	1467	0.21	1136	35	57	1228	33
E	6603	448	1188	0.18	814	18	28	860	12
F	1406	81	219	0.16	189	2	4	195	0
G	6770	153	424	0.06	168	9	12	189	1
H	14765	1417	3513	0.24	1455	5	52	1512	267
I	3050	126	243	0.08	39	0	0	39	2
J	6970	226	432	0.06	85	5	8	98	5
K	3211	145	412	0.13	74	0	8	82	3
BNI[A]					5	0	0	5	0
total	70585	4505	11870	0.17	4426	82	181	4689	471

[A] Bernard Island